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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/973,814

10/11/2001

Toshiaki Kuniyasu

Q66676

7822

7590

08/11/2004

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EXAMINER

NGUYEN, TUAN N

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/973,814	<b>Applicant(s)</b> KUNIYASU ET AL.	
	<b>Examiner</b> Tuan N Nguyen	<b>Art Unit</b> 2828	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 May 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 12-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 12-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/30/04; 01/29/04</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. In response to applicant's amendment filed October 28, 2002, claims 1, 12, 17 have been amended, claims 10, 11 have been canceled, and claim 18 has been added.
2. Applicant's arguments with respect to claims 1-9, 12-18 have been considered but are moot in view of new ground(s) of rejection.

### ***Drawings***

3. Drawings filed on 10/11/2001 has been accepted.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of 35 U.S.C. 102(e) which forms the basis for all obviousness rejections set forth in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent.

5. Claims 1-4 are rejected under 35 U.S.C. 102(e) as being unpatentable over Horie et al. (IEEE Photonics Technology Letter Vol. 12. No. 1, January 2000).

With respect to claim 1 Horie et al. (IEEE) discloses and shows in (Fig 1) a semiconductor comprising a substrate, a cladding layer and a contact layer (Fig 1: GaAs substrate, Cladding, GaAs contact); two exposed portions having a depth, a ridge portion which has a current injection window form on top surface of ridge portion; a portion contact layer is remove, an insulating film is form cover contact layer excluding current injection window, and an electrode form on a portion of contact layer exposed to current injection window (Fig 1: ridge, Current Injection window, contact, electrode).

With respect to claims 2-4 Horie et al. also shows the uppermost layer is an etch-stopping layer, and cladding layer is AlGaAs, while contact layer is GaAs (Fig 1: Contact, Cladding)

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or non-obviousness.

7. Claims 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horie et al. (IEEE Photonics Technology Letter Vol. 12. No. 1, January 2000), in view of Fukunaga et al. (US 6396863).

With respect to claims 5,6 Horie et al. (IEEE) discloses the above. The claims further requires the etch-stopping comprises InGaP. Fukunaga '863 discloses the etch stopping layer comprises of InGaP. It is within the general skill of a worker in the art at the time the invention

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was made to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

With respect to claim 7, Fukunaga '863 discloses the cladding layer is below the etch-stopping layer, having the same conductivity and lattice match with respect to the substrate (Description, Claim 1).

With respect to claims 8-9, Horie et al. (IEEE) shows a side face of contact layer exposed portion is situated inside an edge of tope surface cladding and the contact layer is range between 5-50um.

8. Claims 12, 14-16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukunaga et al. (US 6396863), or Fukunaga et al. (US 627691).

With respect to claims 12, and 18 Fukunaga et al. '863 / '691 (ABSTRACT; SUMMARY; DESCRIPTION; CLAIMS) discloses a semiconductor having resonator end faces having first and second cladding, first and second optical waveguide, a first and a second InGaAsP barriers having a given tensile strain, an InGaAsP quantum well active layer, and a second conduction type contact layer stacked on tope of GaAs substrate; wherein first and second claddings, and first and second optical waveguide having a lattice match with respect to GaAs substrate; the total thickness of first and second barrier is between 10-30nm; the first and second barrier layer have tensile strains respect to GaAs substrate and thickness between 0.05-0.2nm; the quantum well active layer has a lattice match with substrate and tensile strain *approximate to 0.007* (Claim 1); and a current non-injection region near resonator end faces. The claim further requires a solid-state crystal use with the excitation of the semiconductor. It

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has been held that omission of an element and its function, in this case is the crystal, in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. *In re Karlson*, 136 USPQ 184.

With respect to claims 14-16, Fukunaga et al. '863 discloses the contact layer comprises GaAs and cladding layer not etched and the current non-injection region is between 5um-50um (Col 7-10). It has been held where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

9. Claims 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukunaga et al. (US 6396863) in view of Horie et al. (IEEE Photonics Technology Letter Vol. 12. No. 1, January 2000).

With respect to claim 13, the claim further requires a current on-injection, an insulating film, a current injection window, and an electrode formation. Fukunaga et al. '863 discloses the above and Horie et al. discloses and shows in (Fig 1) a current on-injection formed by removing at least a portion of contact layer, an insulating film is formed from the remaining contact layer, a current injection window formed by removing a portion of insulating film, and an electrode formed on a portion of said insulating film. It would have been obvious to one of ordinary skill in the art to provide Fukunaga et al '863 the elements/process as taught or suggested by Horie et al. (IEEE) to have a semiconductor laser device having current injection window.

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8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horie et al. (IEEE Photonics Technology Letter Vol. 12. No. 1, January 2000) in view of Fukunaga et al. (US 6516016).

The claim further requires a solid-state laser crystal being excited by the semiconductor excitation light source. Horie et al. discloses the semiconductor excitation light source above, while Fukunaga et al. '016 further disclose similar semiconductor excitation light source in coupling with a solid state laser crystal, which are widely use in the field. (Col 2: 54-67). It would have been obvious to one of ordinary skill in the art to provide Horie et al. the solid state crystal as taught or suggested by Fukunaga et al '016 to convert wavelength of the laser output.

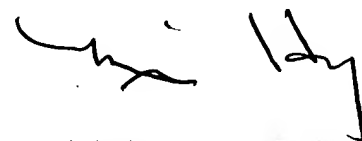
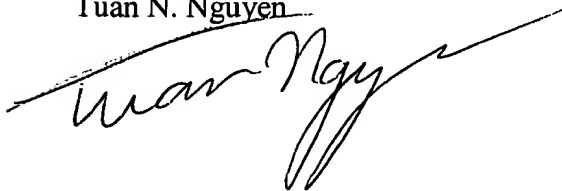
***Communication Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan N Nguyen whose telephone number is (571) 272-1948. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harvey Minsun can be reached on (703) 308-16741. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3329.

Tuan N. Nguyen



MINSUN OH HARVEY  
PRIMARY EXAMINER